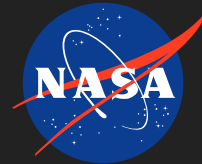


Prognostic and Fault Tolerant Reconfiguration Strategies for Aerospace Power Electronic Controllers and Electric Machines, Phase II

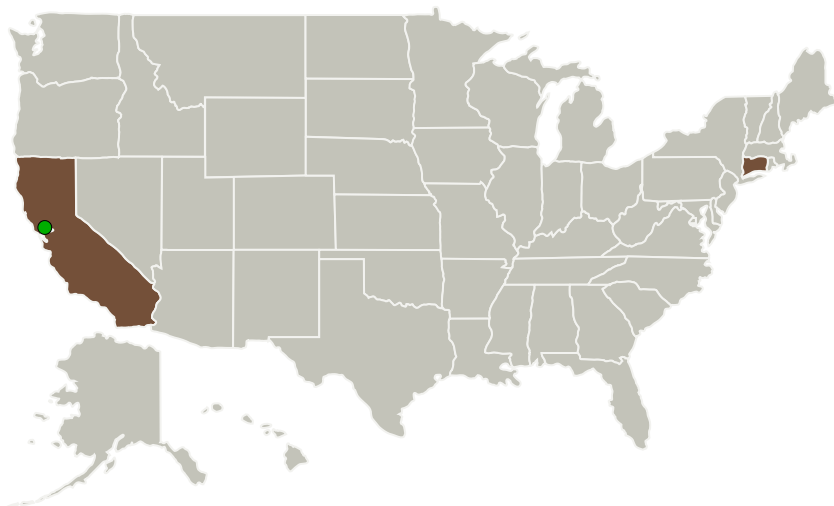
II
Completed Technology Project (2010 - 2012)



Project Introduction

Impact Technologies has proposed development of a real-time prognostic and fault accommodation system for power converters and electro-mechanical (EM) drive applications. The main goal for this program is development of techniques that enable fault tolerant control based on diagnostic features from the coil winding and power transistors. During Phase I, Impact achieved substantial and promising results in three main technical areas that provide opportunities to maturing tools that enable PHM and reconfiguration techniques. The technical areas include: Transistor Performance, Motor/Actuator Performance, and Fault Tolerant Reconfiguration. During Phase II, a significant effort will be employed to further develop the automated ringing feature extraction feature, leakage current sensing capabilities, and reconfiguration techniques for continued motor operation. These efforts will lead to development of prototype sensors for IGBT aging detection and current leakage detection as a health indicator of aging effects in power drives. Moreover, Impact will demonstrate reconfigurable control techniques for fault accommodations in EM applications. The long term implications of a successful completion of this program will provide reliability and health management tools for mission and safety critical applications for NASA, commercial, and military enterprises.

Primary U.S. Work Locations and Key Partners



Prognostic and Fault Tolerant Reconfiguration Strategies for Aerospace Power Electronic Controllers and Electric Machines, Phase II

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Organizations Performing Work	Role	Type	Location
Sikorsky Aircraft Corporation	Lead Organization	Industry	Stratford, Connecticut
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Connecticut

Project Transitions

▶ **January 2010:** Project Start

✓ **January 2012:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/139352>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Sikorsky Aircraft Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

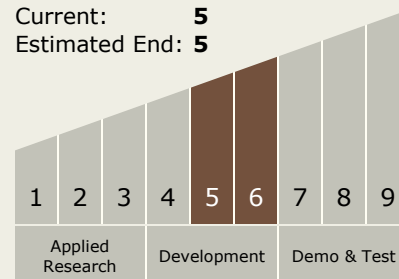
Carlos Torrez

Principal Investigator:

Antonio Ginart

Technology Maturity (TRL)

Start: 6
Current: 5
Estimated End: 5



Prognostic and Fault Tolerant Reconfiguration Strategies for Aerospace Power Electronic Controllers and Electric Machines, Phase II

II
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Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.2 Reasoning and Acting
 - └ TX10.2.6 Fault Response

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System